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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,843	12/08/2003	Maged F. Barsoum	H0488	9249
45114 7590 03/28/2007 HARRITY SNYDER, LLP 11350 Randon Hills Road SUITE 600 FAIRFAX, VA 22030			EXAMINER BAYARD, EMMANUEL	
			ART UNIT	PAPER NUMBER
			2611	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/28/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/728,843

Applicant(s)

BARSOUM, MAGED F.

Examiner

Emmanuel Bayard

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 21-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-8, 10, 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirakata et al U.S. Pub No 2004/008618 A1 in view of Ho et al U.S. Patent No 6,148,024.

As per claims 1 and 16, Shirakata et al teaches device configured to receive data transmitted over a network medium, comprising: a memory configured to store first phase information associated with a first pilot tone (see fig.4 element 8c and page 3 [0023] and page 9 [0114-0119]) and logic configured to: identify a second pilot tone received with a plurality of tones (see fig.4 element 8b and page 3 [0023, 0030]); determine second phase information associated with the second pilot tone, determine a difference between the second phase information and the first phase information, use the difference to determine offset information (see fig.4 element 8d and page 9 [0119-0122]); modify phase information associated with each of the plurality of tones based on the offset information (see fig.4 elements 8e, 8f and page 9 [0121-0122] and page 10 [0123-0127]).

However Shirakata does not teach decode data transmitted on each of the plurality of tones using the modified phase information.

Art Unit: 2611

Ho et al teaches decode data transmitted on each of the plurality of tones using the modified phase information (see fig.2 output of element 30 and col.3, lines 49-53 and col.5, lines 1-15).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Ho into Shirakata as to accurately recover the multitones, which have been distorted by noise using a DFT as taught by Ho et al (see col.3, lines 43-46).

As per claim 2, Shirakata teaches dividing and multiplying the phase difference to determine a phase correction (see page 9 [0119 , 0122] and fig.4 elements 8e and 8f). Furthermore implementing such teaching in a logic to determine offset information to divide the difference by a value associated with the first pilot tone to obtain a first value, and multiply the first value by values associated with each of the respective plurality of tones to determine a phase correction for each of the respective plurality of tones would have been obvious to one skilled in the art as to accurately obtain the amount of phase change from the slope as taught by Shirakata (see page 9 [0122]) .

As per claims 3, 5 Shirakata teaches dividing the phase difference to determine a phase correction (see page 9 [0122] and fig.4 elements 8e and 8f). Furthermore implementing such teaching in a logic to: divide the difference by a frequency of the first pilot tone would have been obvious to one skilled in the art as to accurately obtain the amount of phase change from the slope as taught by Shirakata (see page 9 [0122]).

As per claims 4, 6 and 8 Shirakata teaches multiplying the phase difference to determine a phase correction (see page 9 and fig.4 elements 8e and 8f). Furthermore implementing such teaching in a logic wherein when multiplying the first value by values

associated with each of the respective plurality of tones, the logic is configured to: multiply the first value by a frequency of each of the respective plurality of tones would have been obvious to one skilled in the art as to accurately obtain the amount of phase change from the slope as taught by Shirakata (see page 9 [0122]).

As per claim 7, Shirakata teaches wherein the first pilot tone is transmitted with a group of tones and the logic is further configured to: identify the first pilot tone, and determine the first phase information associated with the first pilot tone (see fig.4 and page 3 [0023, 0030] and page 9 [0119-0122])).

As per claims 10, Shirakata et al teaches all the features of the claimed invention except decoding data transmitted on each of the plurality of tones using the modified phase information.

Ho et al teaches decode data transmitted on each of the plurality of tones using the modified phase information (see fig.2 output of element 30 and col.3, lines 49-53 and col.5, lines 1-15).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Ho into Shirakata as to accurately recover the multitones, which have been distorted by noise using a DFT as taught by Ho et al (see col.3, lines 43-46).

As per claims 15, Shirakata et al teaches all the features of the claimed invention including receiving a second plurality of tones (see claim 1 rejection above); determining second phase correction information associated with the second plurality of tones based on a phase of a pilot tone transmitted with the second plurality of tones (see claim 1 rejection above);; modifying phase information associated with each of the

Art Unit: 2611

second plurality of tones based on the second phase correction information (see claim 1 rejection above).

However Shirakata does not teach decode data transmitted on each of the plurality of tones using the modified phase information

Ho et al teaches decode data transmitted on each of the plurality of tones using the modified phase information (see fig.2 output of element 30 and col.3, lines 49-53 and col.5, lines 1-15).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Ho into Shirakata as to accurately recover the multitones, which have been distorted by noise using a DFT as taught by Ho et al (see col.3, lines 43-46).

As per claim 17, Shirakata teaches wherein the first and second predetermined tones each comprise a pilot tone (page 3 [0023, 0030] and page 9 [0114-0119]).

As per claim 18, Shirakata teaches dividing and multiplying the phase difference to determine a phase correction (see page 9 [0119, 0122] and fig.4 elements 8e and 8f). Furthermore implementing such teaching, to modify phase information associated with each of the plurality of tones, the logic is configured to at least one of: divide the difference by at least one of a frequency and tone number associated with the pilot tone to obtain a first value and multiply the first value by at least one of a frequency and tone number associated with each of the plurality of tones; and multiply the difference by a ratio of the frequency of each of the respective plurality of tone to the frequency of the second predetermined tone would have been obvious to one skilled in

Art Unit: 2611

the art as to accurately obtain the amount of phase change from the slope as taught by Shirakata (see page 9 [0122]).

As per claim 19, Shirakata et al teaches all the features of the claimed invention including wherein the logic is further configured to: receive a plurality of symbols, each symbol comprising a number of tones (see rejection of claim 1 above), determine a difference between the first phase information and phase information associated with a pilot tone in each of the plurality of symbols, and modify phase information associated with each of the tones in each of the respective plurality of symbols based on the respective differences (see rejection of claim 1 above),.

As per claim 20, Shirakata et al teaches all the features of the claimed invention including: determine a new difference at predetermined time intervals, the new difference corresponding to a difference between phase information associated with a pilot tone and the first phase information, and modify phase information associated with received tones based on the new difference(see rejection of claim 1 above).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Art Unit: 2611

4. Claims 9 and 11-14 rejected under 35 U.S.C. 102(e) as being anticipated by Shirakata et al U.S. Pub No 2004/008618 A1.

As per claim 9, Shirakata et al teaches a network device that receives data transmitted using discrete multi-tone (DMT) modulation, a method comprising: storing phase information associated with a first pilot tone (see fig.4 element 8c and page 3 [0023] and page 9 [0114-0119]) ; receiving a plurality of symbols (see page 5 [0053] and page 6 [0091]); identifying a second pilot tone in at least one of the plurality of symbols (see fig.4 element 8b and page 3 [0023, 0030]); determining second phase information associated with the second pilot tone (see page 9 [0119-0122]); obtaining a difference between the first phase information and the second phase information (see fig.4 element 8d and page 9 [0119-0122]); dividing the difference by a value associated with the first pilot tone to obtain a first value (see page 4 [0037-0038]); multiplying the first value by values associated with each of the respective plurality of tones to determine phase correction information for each of the respective tones (see page 9 [0120] and fig.4 elements 8e and 8f); and modifying phase information associated with each of the plurality of tones based on the phase correction information(see fig.4 element 9 and page 9 [0121-0122] and page 10 [0123-0127]).

As per claim 11, Shirakata inherently teaches wherein the obtaining comprises: subtracting the second phase information from the first phase information (see page 9 [0120]).

As per claim 12, Shirakata inherently teaches wherein the dividing the difference by a value associated with the first pilot tone comprises: dividing the difference by a frequency of the first pilot tone (see page 4 [0037-0038]).

As per claim 13, Shirakata inherently teaches wherein the multiplying the first value by values associated with each of the respective plurality of tones comprises: multiplying the first value by a frequency of each of the respective plurality of tones (see page 9 [0120]).

As per claim 14, Shirakata inherently teaches, wherein the dividing the difference by a value associated with the first pilot tone comprises: dividing the difference by a tone number of the first pilot tone, and wherein the multiplying the first value by values associated with each of the respective plurality of tones comprises: multiplying the first value by a tone number of each of the respective plurality of tones (see page 4 [0037-0038] and page 9 [0120]).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Park et al U.S. patent No 6,470,030 B1 teaches an orthogonal frequency division.

McCallister et al U.S. Patent No 5,878,085 teaches a trellis-coded modulation.

Nakahara et al U.S. Pub No 20060104195 A1 teaches an OFDM signal.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number is 571 272

Art Unit: 2611

3016. The examiner can normally be reached on Monday-Friday (7:Am-4:30PM)

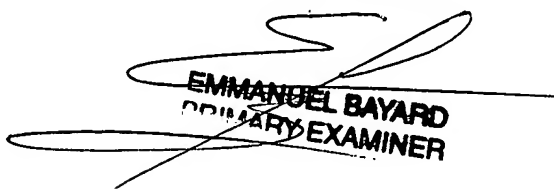
Alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571 272 2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Emmanuel Bayard
Primary Examiner
Art Unit 2611

3/26/07



EMMANUEL BAYARD
PRIMARY EXAMINER